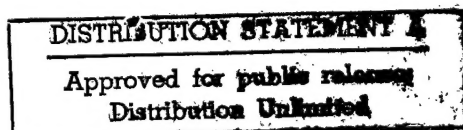


Trauma, Stress & Health

Military Women in Combat, Deployment & Contingency Operations

Recommendations

DTIC QUALITY ASSURANCE



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Contingency Operations and Trauma”**

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In order to understand the effects of combat, deployment and contingency operations on women's health, information from a wide array of people and institutions is required. Our gratitude goes to all those who have supported us in this work. The most important are those men and women from all the Armed Services who have participated in studies which expand our knowledge in this area. We are indebted to them for taking time to assist us in these efforts. Our thanks go also to the cadre of military and civilian personnel who authorized our involvement and encouraged our work. We would like to specifically recognize the Surgeon General of the Air Force, Lt Gen Edgar R. Anderson, and Lt Col Daniel R. Brown, Research Programs Officer for the Air Force Medical Operations Agency, for their support.

We are grateful to all the civilian and military experts who shared their observations on military women's health from a variety of perspectives. Their candor and valuable insights will provide guidance on a wide range of topics bearing on the physical and mental health of our military women and men.

Executive Summary

The systematic study of women's health issues in the military is timely for women in all branches of service. Numbering approximately 10% of active duty service members, women are increasingly assuming critical positions of responsibility which fully expose them to the hazards of combat. Following the collapse of the Berlin Wall, the resulting global instability has required the military to prepare its forces, including women, to engage in planning for a number of mission contingencies. These missions include peacekeeping (e.g., Sinai MFO treaty; Bosnia), peacemaking (e.g. Haiti), humanitarian aid (e.g., post-ODS civilian refugee care; Somalia), disaster response to natural and manmade disasters (e.g., Hurricane Andrew & Los Angeles riots), and, of course, combat, in the air, on land and at sea.

At present, military women are confronted by both direct and indirect (secondary to support roles) combat exposure. Military leaders have long recognized that mission readiness requires both the absence of disease and the presence of mental, physical, and spiritual health. However, little is currently known about how the health of military women may be uniquely affected by extreme environments. Such knowledge is essential to meet the health needs of military women and to sustain fitness for all mission contingencies.

Servicepeople are naturally concerned with maintaining their health as an integral part of their readiness to assume any mission they are trained to perform. Research aimed at identifying and understanding overall and gender-specific stressors involved with combat stress, trauma, and extreme environments will enhance the ability of individual servicewomen to care for themselves within an institution that is informed of and concerned with their needs. Educational and preventive measures resulting in servicewomen assuming informed responsibility for their health needs within the context of a supportive group system parallels the process of fostering individual initiative and group cohesion that is essential to mission performance on aircraft, ships, and battlefields.

Gender differences can at times be real, but also of no practical use or importance. Gender differences in health and stress response may confer advantages or disadvantages depending on the context. Present research on stress and gender indicate that women are more likely than men to be depressed and describe phobias and panic attacks (Baum & Grunberg, 1991). It has often been assumed that women experience less stress at work than men, although data are scant on this issue. Women are more likely to visit physicians and seek health care; many of the reported differences in rates of illness may result from this factor.

Gender may mediate the effects of stress on health in several ways. Firstly, directly through biological differences. Secondly, by affecting perception, interpretation and attribution of the external event. Some data indicate that women are more willing to report distress than men, although illness and physiologic responses may not differ from males. Thirdly, women generally report greater social supports than men. Social supports (e.g. unit cohesion) are well known to affect health, either directly or by improving coping. Fourthly, women may use different coping behaviors or use the same coping behaviors at different rates. Smoking and alcohol use are examples of coping strategies that have traditionally been used more frequently by men. As increasing numbers of women adopt similar coping strategies, the effects of stress on health may also change in women.

Studies on the effects of exposure to a number of traumatic events illustrate the complexity of understanding the potential effects of combat stress on women. Data indicate greater risk for posttraumatic stress disorder in single parents with children than in married parents with children, and higher rates of somatization among women in general. Higher rates of substance abuse and violence in men and the higher base rates of depression, greater social supports and higher reported distress after exposure to death and the grotesque in women, may lead to different responses to trauma across genders. In addition, differences across the menstrual cycle in fatigue, chronic stress tolerance, and effects of sleep deprivation may increase or decrease stress tolerance and health effects.

This multi-study programmatic project was focused on understanding the effects of the stress of combat, trauma and extreme environments on women's health and performance. Through this project we have identified critical health and performance issues related to women in the extreme environments of combat, peace-keeping, peace-making, humanitarian operations, and deployment. The project consisted of four parts which addressed the effects of these stressors in operational environments.

Part I: *Computerized Database on Women's Health and the Stress of Combat, Trauma and Extreme Environments:* A computerized literature database on the effects of extreme environments, combat, stress and trauma on women's psychological health and performance was developed. It broadly examined the biopsychosocial stressors and responses in women by collecting English language non-classified epidemiological and stress research in these areas and by examining analogous areas in which relevant conclusions can be drawn (studies of disaster events, confined environments, Antarctica, space, etc.) The database also includes references and abstracts of articles on stress and women's health, traumatic stress, occupational risk factors, deployment, disaster medicine, humanitarian aid, ethical considerations, and sexual harassment. All articles were screened for relevance and scientific quality. The database is on CD-ROM as well as on diskette and is accessible by personal computer using software that is readily available (PROCITE) and the standard of the field.

Part II: Empirical Studies: This part of the project empirically examines trauma and women's health in existing datasets collected by our research group. We analyzed several of our existing datasets of military women exposed to traumatic events, e.g., Operation Desert Storm, Hurricane Andrew, three airplane disasters, and epidemiologic data of women in the military. We also examined our existing data on the spouses of active duty men involved in these traumas. Our data sets include extensive assessments of physical and mental health, posttraumatic distress and psychosocial functioning. Analyses describe each group of women and in several of the studies compare them with a matched group of men and, in some studies, women with similar exposure or with no exposure. Particular attention is given to rates of possible PTSD symptoms, levels of somatization, depression, hostility, fatigue and health care utilization. These studies include:

1. Women deployed on the USS Comfort during Operation Desert Storm (N = 200, 35% women). Data during deployment and follow-up data were examined.
2. Homestead Air Force Base personnel after Hurricane Andrew (N = 243, 10% active duty women; spouses of active duty men, N=145) and matched control groups from MacDill and Shaw AFB (N=150, 10% active duty women; and spouses of active duty men, N = 90).
3. Sioux City, Iowa, United Airlines plane crash. We examined our data on the disaster workers (185th Air National Guard Fighter Group) and their spouses. We have data from a matched control group at the Air National Guard Unit in Sioux Falls, South Dakota. The groups were matched by mission and sociodemographics of the communities. The total sample size was : N = 308 (Sioux City) and 421 (Sioux Falls). Approximately 10-15% of each of these groups are women. In addition, a sample of women indirectly exposed to the trauma of the crash (spouses of the ANG groups) was available (N= 196 for Sioux City; N= 255 for Sioux Falls). Thus we examined both high direct exposure to the air crash and indirect trauma exposure in the spouses using matched control groups.
4. The 1988 Italian Air Show crash at Ramstein AFB. We have data from people involved at the Ramstein Medical Clinic (N = 126). We also have data from personnel at nearby Landstuhl Medical Center who treated victims of the disaster (N = 234). Approximately 35% of each of these groups are active duty service women.
5. Active duty enlisted army troops from Fort Ord and Fort Carson (N = 2223 with 403 women) addressing garrison stressors and mental and physical health. We focused our analysis on two epidemiologic studies, e.g., the General Health Questionnaire (GHQ), and the General Well-Being measure as well as measures of unit and personal morale.

Part III. *Expert Panel:* Distinguished military, academic, and civilian experts were convened to review identified areas of stress effects on women's health from the database and empirical data analyses. Military experts from the United States Armed Forces as well as from overseas were invited. The extensive range of professional expertise and relevant scientific data provided the basis for developing mission-specific recommendations for tri-service distribution.

Part IV: *Summary of Critical Areas by Area Experts:* A volume containing solicited contributions by experts in the field was compiled. This volume expands upon issues which are especially important to understanding the health effects of extreme environments on women.

Recommendations

A number of recommendations result from this project. We have highlighted 20 major recommendations from this work. This is followed by a more extensive set of recommendations, including these priority items. These are presented in Section III. (Additional and more detailed comments, discussion, and recommendations are also available in the separate volumes.) These recommendations address the accumulated knowledge of extreme stress on women's health and performance and resulting operational needs of command; training; medical care; and research. They are categorized by: Command, Medical Care, Performance, and Research. There is substantial overlap among recommendations, reflecting the close interplay among performance, health, and psychological factors in women responding to trauma, disaster, and combat. These recommendations should serve as the basis for the development of medical policy relevant to command, training, performance requirements and needed research.

Priority Recommendations

1. Studies on the stress of homecoming following war trauma are greatly needed. Homecoming stress may differ by gender and requires further study to identify gender related stress responses and coping strategies since they are related to health care utilization as well as morbidity and mortality. Examining recovery from PTSD in several available civilian models (motor vehicle accidents, traumatic injury and in family violence) will provide information relevant to homecoming and recovery from war trauma.
2. Studies seeking to explore gender effects should not be conceived of or labeled as "women's studies" in the military. Rather, research should focus on military units which include men and women. Gender should be considered as one variable and studies of performance and health should be encouraged to address this variable in their design.
3. Although women report greater stress in response to many events, it is unclear how this reporting relates to long-term outcomes relative to performance, morbidity and disability. Specific measures of performance, morbidity, and disability should be included in such studies. Research should study end points which are militarily relevant; e.g., research regarding days lost as well as medical symptoms reported.
4. It is important to study attribution processes (e.g., how "cause" is assigned). Attribution processes have become highly important to understanding "ODS Syndrome" where medical problems are attributed to ODS service although no data support this belief. In addition, attribution can result in stigmatizing certain populations such as higher ranks or ethnic groups or genders. Gender differences in attribution may well be present. Medical care and planning after homecoming will benefit greatly from better understanding in this area.

5. Studies examining gender and traumatic/combat stress should pay particular attention to self-selection, individual past history, training experiences, and past exposures to traumatic events as potential confounds of any findings attributed to gender.

6. A Joint Military Medical Readiness Center with fellowship opportunities should be established in which medical personnel (male and female) can meet across services and across disciplines to receive readiness training and professional military education periodically during a career. (Similar to Command & General Staff/War College but with shorter course periods, e.g., 1-6 months.) This will increase knowledge of cross service gender differences and decrease gender-related combat differences which may appear in joint operations. An institution such as the Uniformed Services University can well serve this purpose and both maintain lessons learned and incorporate new changes rapidly for the education and training of future medical leaders.

7. Joint conferences/seminars of scientists and commanders and the development of a Clinical Scientist Training Program which include operational and scientific experience are needed. Military scientists must be able to understand and respond to the needs of the line consumers of research. It is also important to assist people in policy and administrative positions to apply the available data; to understand the research methods used; to know what works and what does not; and to identify the relative strengths and weaknesses of various studies.

8. The Department of Defense should develop a twin registry of female twins serving in the US military. This would be similar to the twin registry of male Viet Nam era twins. In 1995, there were 194,000 women serving in the Armed Forces. In the United States, 1 in 83 deliveries is a twin birth. One might, therefore, expect over 2,000 women in the Armed Forces are members of a twin pair. Such a registry would significantly enhance research on women and stress.

9. The impact of new missions on deployable units should be studied. Past research performed on units which have deployed en bloc may not generalize to current deployments in which parts of a unit or 1-2 individuals from a unit deploy. Examinations of the issues associated with the particular stressors involved in deploying ones and twos are needed. Gender integrated units may experience deployment stressors differently when deployment of parts of a unit cause different work distribution on remaining members. This research should also examine the role of leadership which becomes the only common denominator in deploying in ones and twos.

10. Mixed gender crew studies should be carried out for both short and long-term missions. Study of cognitive function, in particular, has rarely been examined in mixed gender crews. Such studies will aid in understanding multi-person crew function and may be much more relevant than other biological variables to actual crew performance.

11. Studies of single parents should be initiated. Single soldiers with children (the larger number of whom are male, but a higher percentage of whom are female) are an understudied group which may be more vulnerable to combat stressors due to less adequate social supports and instrumental assistance.

12. Studies of the effects of mother absence (in single parent and dual parent families) on children are greatly needed. The effects of father absence on children has been studied. However, comparable research studying the effects of mother absence is lacking. Studies in civilian populations are unlikely to be comparable because the demographics of military women (highly educated, employed) are very different from civilian counterparts. This gap in our knowledge base must be remedied.

13. Study of physical health problems reported following traumatic exposure is needed. Increased physical health problems are associated with the diagnosis of PTSD in women and men. Little is known about these physical health problems e.g., to what extent they are related to injury vs. somatization.

14. The relationship of substance abuse and deployment to family violence in the military requires examination in order to better understand episodes of family violence in the military community. The study of spousal violence in dual active duty and female on active duty families is needed to clarify the higher rates seen in these groups.

15. Studies of substance abuse in active duty men and women indicate that substance use among military women is associated with factors other than stress while substance abuse among military men is highly associated with stress. Identification of the different mechanisms fostering substance abuse in active duty men and women can aid in the development of prevention programs and education efforts targeted by gender.

16. Because of high rates of deployment and joint international operations, medical care providers must be taught the various ways in which stress symptoms manifest themselves in different cultures, genders and organizational contexts. Additionally, health care providers need education on the recovery from stress symptoms over time (e.g., differences in intrusion and arousal symptoms), how one might recover from some symptoms and not the others, and how these symptoms might be reflected differently in various sub-populations, including genders.

17. It is important to examine the relationship of past experience and training, previous traumatic event exposure and exposure to combat on post-combat PTSD, combat stress reaction, depression and substance abuse. There are data that experience (e.g. past combat) can both inoculate individuals and sensitize them. At present, the data support both views: that past experience helps prevent breakdown and that it potentially increases breakdown. In view of the military's missions, it is imperative that the different impacts of exposure be clarified and any gender effects identified.

18. The changed nature of the "front line" in battle has serious ramifications for medical readiness planning. As the tempo of operations has increased throughout the various echelons of care, readiness training includes what goes on at the homefront. ODS showed that when the tempo of operations has increased to a high pace, stress casualties can occur at medical centers in the rear as well as the front. Research designed to identify and monitor care providers' stress at the various echelons is needed. Such research should guide readiness training in the broad view of the combat field that now extends from frontline to home bases/posts in this era of expanded missions.

19. A new generation of military medical consultants, scientists, and researchers must be developed. This education and training should be accomplished across health care specialties. The Fellowship in Military Psychiatry at the Uniformed Services University of the Health Sciences should serve as a model for training military specialists to serve in research, education and as consultants to the Surgeons General.

20. Studies of gender examine what works, e.g., what are the factors that predict women's successful integration into a unit in which their introduction enhances the performance of the unit, or what is it about the command climate in which sexual harassment is not found versus those in which it is. Research must examine factors which promote resiliency as well as those which induce vulnerability.

SUMMARY OF RECOMMENDATIONS

TRAUMA, STRESS & HEALTH

RESEARCH

1. Studies on the stress of homecoming following war trauma are greatly needed. Homecoming stress may differ by gender and requires further study to identify gender related stress responses and coping strategies since they are related to health care utilization as well as morbidity and mortality. Examining recovery from PTSD in several available civilian models (motor vehicle accidents, traumatic injury and in family violence) will provide information relevant to homecoming and recovery from war trauma.
2. Studies seeking to explore gender effects should not be conceived of or labeled as “women’s studies” in the military. Rather, research should focus on military units which include men and women. Gender should be considered as one variable.
3. It is important to study attribution processes (e.g., how “cause” is assigned). Attribution processes have become highly important to understanding “ODS Syndrome” where medical problems are attributed to ODS service although no data support this belief. In addition, attribution can result in stigmatizing certain populations such as higher ranks or ethnic groups or genders. Gender differences in attribution may well be present. Medical care and planning after homecoming will benefit greatly from better understanding in this area.
4. Studies of gender should examine what works, e.g., what are the factors that predict women’s successful integration into a unit in which their introduction enhances the performance of the unit, or what is it about the command climate in which sexual harassment is not found versus those in which it is. Research must examine factors which promote resiliency as well as those which induce vulnerability.
5. Studies of single parents should be initiated. Single soldiers with children (the larger number of whom are male, but a higher percentage of women) are an understudied group which may be more vulnerable to combat stressors due to less adequate social supports and instrumental assistance.
6. Studies of the stress of homecoming should include conceptualizing homecoming as an additional culture shock after adaptation to a new and foreign cultural environment.
7. Studies of “natural debriefing” that occur in supportive units and with spouses and peers will increase our knowledge of recovery from combat stress and the prevention of chronic PTSD.
8. The impact of new missions on deployable units should be studied. Past research performed on units which have deployed en bloc may not generalize to current deployments in which parts of a unit or 1-2 individuals from a unit deploy. Examinations of the issues associated with the particular stressors involved in deploying ones and twos are needed. Gender integrated units may experience deployment stressors differently when deployment of parts of a unit cause different work distribution on remaining members. This research should examine the role of leadership which becomes the only common denominator in deploying in ones and twos.

9. Studies are needed to examine the interaction of family, work, and children on health and performance. Particular attention should be given to the study of single parents. Such studies should examine the effects and interaction of these variables on drug abuse, family violence, depression, suicide attempts, and nicotine abuse as well as sleep loss, health care utilization and recovery time after exposure to high stress environments. Additionally, the interaction of these variables is an important research question that is rarely examined and which should be.

10. Group and unit composition by gender should be studied as a variable affecting cohesion, rates of depression, unit performance, and individual psychological well-being.

11. Research is needed on the study of depression in active duty women and its relationship to stressful life events and suicide attempts.

12. Studies should examine suicide among active duty women. Active duty women do not show the “protective effect” (lower rate) of suicide seen in active duty men versus civilian counterparts.

13. New studies should be initiated to identify rates of suicide attempts among active duty women and men. These studies should include gender of the attempter and gender composition of the units. It is not known whether or not suicide attempts in the military are greater or less than comparable civilian populations.

14. Studies of behavioral contagion related to suicide attempts, depression, and performance decrement should be initiated. Contagious behaviors can have significant effects on unit cohesion and performance.

15. Mixed gender crew studies should be carried out for both short and long-term missions. Study of cognitive function, in particular, has rarely been examined in mixed gender crews. Such studies will aid in understanding multi-person crew function.

16. Studies should examine the effects of stress, extreme environments, and fatigue on attention in high stress environments with particular focus on differential attention strategies used by gender which may be helpful in training.

17. Studies at the levels of basic brain mechanisms should be alert to sexual dimorphism in the brain related to testosterone and spatial ability.

18. Research studying the effects of hormonal variation on cognitive performance should be alert to the hormonal variation which also occurs with men across seasons.

19. Research on cognitive performance should be alert to the relevance of laboratory chosen tasks to military performance. The effect size (i.e., power of the relationship) is not known for a number of relevant military stressors (e.g., boredom, novelty, fatigue, and stress) on specific cognitive variables. Examination of these effect sizes will be important to identify if gender differences are important in real life military-specific task.

20. The relationship of substance abuse and deployment to family violence in the military requires examination in order to better understand episodes of family violence in the military community. The study of spousal violence in dual active duty and female on active duty families is needed to clarify the higher rates seen in these groups.

21. A family history of alcoholism is shown to predict a different response to stress (e.g., hyperreaction to stress in autonomic measures). Further study of this relationship is important to better understanding Post-traumatic Stress Disorder, Acute Stress Disorder and Combat Stress Disorder.

22. Behavioral pharmacology studies of the relationship of alcohol as a stress reducer after stress exposure are needed. Alcohol may have an increased stress reducing property in those with a positive family history of alcoholism. This relationship requires further study for examining potential increased alcohol use following combat exposure in individuals with a family history of alcohol. Gender studies in these areas are needed.

23. Studies of prepulse inhibition of autonomic arousal (e.g., presentation of a warning stimulus) indicates possible gender differences. This finding may be important and need study. Such research may clarify the role of anticipatory stress and training in prevention of Post-Traumatic Stress Disorder and Combat Stress Disorder.

24. Although women report greater stress in response to many events, it is unclear how this reporting relates to long-term outcomes relative to performance, morbidity and disability. Specific measures of performance, morbidity, and disability should be included in such studies. Research should study end points which are militarily relevant; e.g., research regarding days lost as well as medical symptoms reported.

25. Differential rates of exposure to traumatic events significantly influence present studies of PTSD. In addition, a number of studies provide data that support the fact that women may be more likely to develop PTSD given exposure. Studies which examine differential rates of PTSD should be encouraged to control for differential exposure rates, measures of empowerment/control (socioeconomic status, occupational status), and perception of threat.

26. Studies of PTSD and type of trauma (e.g., threat to life, exposure to grotesque, loss of buddy) are needed. Occupational role (combat/medical care) significantly influences exposure to different types of traumatic events. To the extent gender is related to occupational role, differential trauma exposure occurs. Little is known about the risk of PTSD for different types of traumatic events.

27. Variables such as socioeconomic status, occupation, and exposure may correlate with gender and at times may give a biased view of gender differences. Further study of the interactions of gender, occupation and type of trauma exposure is needed.

28. Little is known about gender differences in the perception of trauma (e.g., threat, loss, grotesqueness) and its contribution to the development of PTSD. Gender may influence such perception (controlling for type of trauma). Further study is needed in this area.

29. Because of documented high rates of PTSD in female Vietnam veterans (primarily nurses) and the future likelihood of women having greater war trauma exposure, the need to understand PTSD in women is extremely important. The possibility that military women show unique a) vulnerability and/or resiliency; b) differential coping strategies; c) different trauma exposures; indicate the great need for further study of traumatic events in garrison and wartime in active duty military women.

30. Increased physical health problems are associated with the diagnosis of PTSD in women and men. Little is known about these physical health problems, to what extent they are related to injury or somatization. Further study of physical health problems reported following traumatic exposure is needed.

31. Suicide attempts are 4 times more common than completed suicides in women. Further studies of suicide attempts are needed to understand this risk taking behavior, including how it may relate to Command climate.

32. Differential effects of unit climate by gender may be present. Unit climate (e.g., group function, leadership, unit characteristics) should be examined for its effect on both performance, health, and gender interactions.

33. Anticipated stress can be a substantial contributor to morbidity and performance decrements in high stress combat environments. Few studies have examined anticipated stress by gender. Studies that are available suggest that women may report higher levels of anticipated stress. It is unclear how this relates to performance. Further study of the anticipated stress of various combat, deployment and contingency events is needed.

34. Studies examining gender should pay particular attention to individual past history, training experiences, and past exposures to traumatic events as potential confounds of any findings attributed to gender.

35. Research findings on gender should carefully examine possible confounding effects of self-selection and training which may explain some gender difference findings.

36. The Department of Defense should develop a twin registry of female twins serving in the US military. This would be similar to the twin registry of male Viet Nam era twins. In 1995, there were 194,000 women serving in the Armed Forces. In the United States, 1 in 83 deliveries is a twin birth. One might, therefore, expect over 2,000 women in the Armed Forces are members of a twin pair. Such a registry would significantly enhance research on women and stress.

37. In the area of eating disorders, anorexia is of little specific military concern because of the stringent weight standards. However, binge eating disorder and bulimia may be important areas for future study in both males and females. Binge eating and bulimia can be maladaptive coping mechanisms in high stress environments. They are reinforced by emphasis on perfectionism and on lean body appearance. Research on eating disorders is of particular importance because of their association with amenorrhea which is associated with decreased bone density and increased rate of bone fractures in high performance environments.

38. Culture shock can be an important ingredient in long-term deployments and combat engagements which include substantial exposure to civilian populations. The unique elements of culture shock stress which may differ by gender have not been examined. Little data exists on women's (as opposed to men's) reactions to cross-cultural stress in any group in contrast to the vast literature of American women's perception of sources of stress within their own, American, culture. Deployments to countries in which the role of women is substantially different from that in western cultures can be expected to contribute substantially to the culture shock stress. Further studies in this area are needed in order to understand the contribution of this stressor to the development of Post-Traumatic Stress Disorder, depression, and substance abuse.

39. The contribution of culture shock stress to different types of deployments requires further study. Culture shock stress is minimized by short deployments and minimal contact with civilian populations. However, this structuring of deployments has its own stressors which can include increased monotony, boredom, isolation, and lack of adaptation.

40. The major sources of culture stress can be categorized as: communication, mechanical differences (housekeeping), isolation, customs, and attitudes and beliefs. Each of these dimensions requires study for its effects on performance and health.

41. Operations in multinational forces will increase exposure to culture shock stress. Such deployments will show substantial gender differences in culture shock stress. Studies in this area are needed.

42. Leaders maintain an image of what they believe the "troops" are. Such images are frequently tied to the leaders' experiences at the platoon and squadron level. When force structures rapidly change, concerted efforts to educate leaders and modify these images is needed in order to maintain effective leadership. Study of the development and change of leaders troop image/beliefs are needed to aid in leadership development, training, and education.

43. Some studies support differences in anxiety sensitivity (fear of fear) and panic cognitions by gender. Such perceptions are important to understand further. They may influence behavioral responses in high stress environments and indicate specific training needs which may be different between men and women active duty members, i.e., education to decrease "fear of fear" prior to exposure may be more critical for women than for men.

44. Studies of sources of stress within active duty forces need to identify the base rate of high stress events in active duty men and women. Epidemiologic description of rates of stressors and traumatic events in garrison (peacetime) and prior to deployments is needed to identify high risk groups and better predict PTSD risk.

45. Studies of substance abuse in active duty men and women indicate that substance use among military women is associated with factors other than stress while substance abuse among military men is highly associated with stress. Identification of different mechanisms fostering substance abuse in active duty men and women can aid in the development of prevention programs and education efforts targeted by gender.

46. Major stressors experienced by females in the military are substantially different than those for males. As a minimum they are influenced by the following demographic differences:

- a. Women are more likely than men to be unmarried as illustrated in the US Army.
- b. If married, women are more likely than men to have a spouse who is also a member of the military.
- c. Military women have smaller families and younger children than active duty men.
- d. Military women are more likely to have an infant at home. Women are more likely to be single parents and female company grade officers are more likely than their male peers to think they will experience more work/family conflict as they progress in their careers.
- e. Women in the military may also be subject to multiple life stressors (e.g., pregnancy, sexual harassment) to which their male counterparts are not subject, independent of those specifically related to service in the military.

Such findings indicate the importance of clarifying the types of stressors experienced by women in the various services. Studies are needed to identify life stressors and combat, deployment, and homecoming stressors by gender. In addition, further longitudinal investigation is needed into the stressors to which women in the military are exposed throughout their career.

47. Research on health and performance should study end points which are militarily relevant and be alert to the limitations on symptom reporting when looking for gender effects; e.g., research regarding days lost as well as medical symptoms.

48. Wherever possible, comparative populations of women (not only men) should be used to put gender results in proper context.

49. Studies of the effects of mother absence (in single parent and dual parent families) on children are greatly needed. The effects of father absence on children has been studied. However, comparable research studying the effects of mother absence is lacking. Studies in civilian populations are unlikely to be comparable because the demographics of military women (highly educated, employed) are very different from civilian counterparts. This gap in our knowledge base must be remedied.

50. A number of issues related to the biology and psychology of reproduction need further study. These topics include servicemembers' attitudes toward contraception, the possible relation between pregnancy and stigma, implications of sexually transmitted diseases for readiness, and the long-term effects of long-acting contraceptives.

51. Protocols which assess the effects of gender diversity on unit function are needed. Such studies should examine the various skills (performance and interpersonal) which different genders bring to a unit.

52. Research directed at increasing our understanding of the specific (and often different) coping strategies that men and women use in similar operational settings could be applied to teaching all servicemembers a wider assortment of skills adapted to various settings.

53. There is a need for research on the effects of gender and marital status, children, life course development on career development.

54. Studies addressing possible differences in men's and women's perceptions of leadership skills should be conducted. These studies have implications for leadership development and training.

55. Findings from research regarding the development of leadership skills over the life cycle and evaluation of whether women lead differently than men, may enhance performance of all leaders and contribute to better retention of women.

56. The issues of sexual abuse and violence towards women need further study in the military operational settings where anecdotal reports often indicate these events are infrequent.

57. There is a need for research on the differences between sexual harassment and gender discrimination. In focusing on cohesion and common missions, it would be most helpful if these issues could be recast in military language addressing unacceptable behaviors rather than at acts directed towards various classes of individuals. Research could serve to guide policy in these arenas.

58. Research aimed at developing screening procedures has generally been of little help in nearly all settings (except, perhaps, astronaut selection). Success in training exercises has nearly always been the best screening procedure. Studies of gender for screening purposes would not be an optimum use of resources.

59. Further research on family violence and the understanding of the impact of family violence, on the operation of various work units as well as on the individuals within the family are needed. One study indicates that the rates of family violence may be particularly high in families in which there are HIV positive family members and in which there has been violence in the past.

60. The gender of an augmentee may affect the stress of augmentation into a unit and, therefore, the amount of time required to integrate successfully. Research must address the particular stressors associated with the introduction of augmentees into a deployed unit. Hypotheses should be examined on the augmentees' impact on the unit's ability to develop unit cohesion and effectiveness, as well as the effects on the individual. This is of importance since one of the major protective elements in buffering contingency stress is support provided by unit "buddies."

61. It is important to examine the relationship of past experience and training, previous traumatic event exposure and exposure to combat on the development of PTSD, combat stress reaction, depression and substance abuse. There are data that experience (e.g. past combat) can both inoculate individuals and sensitize them to future combat stress reactions. At present, the data supports both views: that past experience helps prevent breakdown and that it potentially increases breakdown. In view of the military's missions, it is imperative that the different impacts of exposure be clarified and any gender effects identified.

62. The changed nature of the "front line" in battle has serious ramifications for medical readiness planning. As the tempo of operations has increased throughout the various echelons of care, readiness training includes what goes on at the homefront. ODS showed that when the tempo of operations has increased to a high pace, stress casualties can occur at medical centers in the rear as well as the front. Research designed to identify and monitor care providers' stress at the various echelons is needed. Such research should guide readiness training in the broad view of the combat field that now extends from frontline to home bases/posts in this era of expanded missions.

63. A new generation of military medical consultants, scientists, and researchers must be developed. This education and training should be accomplished across health care specialties. The Fellowship in Military Psychiatry at the Uniformed Services University of the Health Sciences should serve as a model for training military specialists to serve in research, education and as consultants to the Surgeons General.

64. Operational research should avail itself of "failure mode analysis." This is ideal for operational medicine because it simulates the chaos of a combat setting. Gender should be considered as one variable in assessment.

65. Research should investigate ways in which to bridge the knowledge and skills gaps experienced in deployments to unfamiliar cultures and resource-poor environments. Often wartime deployment means how to “make do” with fewer resources. Contingency training should include similar settings. For example, it may be helpful to use some USPHS hospitals to approximate the challenges faced in working with refugees and other impoverished populations.

66. Joint conferences/seminars of scientists and commanders and the development of a Clinical Scientist Training Program which include operational and scientific experience are needed. Military scientists must be able to understand and respond to the needs of the line consumers of research. It is also important to assist people in policy and administrative positions to apply the available data; to understand the research methods used; to know what works and what does not; and to identify the relative strengths and weaknesses of various studies.

67. Studies of coping in combat, deployment, and contingency operations should identify possible different coping strategies by gender. In addition, even when the same coping behaviors are present, the mechanisms underlying these behaviors that lead to stress reduction may be different.

68. In looking to warfare in the Twenty-First Century, priority should be given to studies of “distributive cognitive functioning.” “Distributive cognitive functioning” is a term which describes how a group (mixed gender) works together in carrying out tasks. Analysis of group function in these specialized environments (e.g. air crew or tank crew) is more complex than simply examining individual eye tracking and neuronal function. Trying to better understand the ways in which temperament, interpersonal style, and mode of functioning can influence the way in which cognitive decision processes occur is of paramount importance to effectively fielding new weaponry and intelligence systems.

69. Research should examine the psychological and performance effects of operational tempo across time (months) and changing deployment patterns (e.g., deployment of one or two individuals rather than a whole unit.) Gender should be included in these studies. Gender differences related to deployment tempo and individual augmentees may identify stressors amenable to intervention.

COMMAND

1. It is instructive to remember that, historically, the military services have integrated numerous populations into the total force. Such processes require commitment to change in the system to maximize performance needs.
2. The effects of gender in the modern battlefield must consider agent, host, and environment as well as situation, mission, and execution. The respective contributions of each of these elements should be assessed when evaluating performance over a range of situations.
3. Data from the US Army Research Institute support the findings that females may want combat exclusion policy to be lifted to provide equal opportunities for all soldiers. However, this does not necessarily translate to large numbers of females seeking this career path for themselves. This finding has implications in terms of the problems associated with potentially integrating a small number of women into male combat units.
4. Logistics, medical, and other pertinent elements must ensure that women on deployments have ready access to gender-appropriate undergarments, hygiene products, contraception and medical care (e.g. availability of Ob/Gyn physicians in field environments).
5. Command should support further research on leadership education, performance, and evaluation. Particular areas of concern include the study of possible differences in men's and women's perceptions of leadership skills that have implications for educating men and women for command. Similarly, further work is needed to explore the development of leadership skills over the life cycle; issues of selection, training and evaluation related to whether women lead differently than men; and what can be gleaned from differences in effective leadership styles that can broaden all leaders' repertoire of skills for a variety of leadership challenges.
6. Despite some differences, the major findings on cognitive functions indicate substantial overlap in skills in any given group of men and women. Specific contextual stressors may be more important than gender differences in cognitive performance areas.
7. In general, the consensus is that there are no substantial differences between men and women in the effect of stress on cognitive performance in most garrison and military environments. Environmental, situational and interpersonal/organizational/contextual stressors rather than gender differences are most often the cause of cognitive performance decrements or gains.
8. Currently there is a twin registry of male Viet Nam veterans but not of women. Command should support and encourage the development of a registry of active duty female twins, for use both during peace and for subsequent wartime events. Ultimately, this registry would benefit our understanding of the relative contributions of biology versus the environment in the development of adaptive and maladaptive responses to combat stressors.

9. Substance abuse in military women, although low as in military men, resembles more the distribution of these disorders in male active duty forces than the distribution in civilian women. Such data may highlight the selection and/or environmental elements involved in the development of substance abuse disorders. Intervention efforts should be developed for women cigarette users in particular.

10. Recent surveys of active duty forces indicate that sources of stress are highly similar between active duty men and women. Women indicate somewhat greater stress related to changes in family and personal health problems. Men report greater stress related to deployment. These findings can guide Command in targeting interventions to the primary stressors of both groups. These findings are probably influenced by job assignments.

11. Substance abuse appears to have been decreasing in both military men and military women since 1980 (heavy alcohol use, illicit drug use, cigarette use). Active duty women are more likely to report high family stress than are active duty men. It is not known whether this represents higher levels of stressful events, differences in perception, or other elements. Command should be alert to the stressors of soldiers' family situations when addressing substance abuse problems.

12. Commanders should attend to risk factors which increase rates of depression and suicide including suicide attempts. Both depression and suicide attempts are reported more often in women and can decrease mission readiness and performance.

13. In view of the increasing numbers of joint operations, sensitivity to social and cultural differences that exist between the services and within the services are important especially in conjunction with the impact of these differences on men and women

14. Command should support efforts to decrease family violence because of its impact on individuals within the family, as well as on the operation of various work units.

15. Command should allocate resources to develop innovative educational tools such as using the INTERNET and interactive video for training on issues affecting medical readiness.

16. Command should become more aware of the important role of anticipatory stress (the stress experienced prior to an event.) Gender differences in anticipatory stress may be present and may relate to training needs and differences in anticipated stressors.

17. Command should examine the use of peer-ratings in evaluations (as well as the present ratings by superiors) as a mechanism to increase our ability to select the best leaders.

18. A Joint Military Medical Readiness Center with fellowship opportunities should be established in which medical personnel (male and female) can meet across services and across disciplines to receive readiness training and professional military education periodically during a career. (Similar to Command & General Staff/War College but with shorter course periods, e.g., 1-6 months.) This will increase knowledge of cross service gender differences and decrease gender-related combat differences which may appear in joint operations. An institution such as the Uniformed Services University can well serve this purpose and both maintain lessons learned and incorporate new changes rapidly for the education and training of future medical leaders.

19. Readiness training for medical units should be supported through a reexamination and determination of what the specific goals for readiness training should be and how they can best be achieved.

20. Leaders maintain an image of what they believe the "troops" are. Such images are frequently tied to the leaders' experiences at the platoon and squadron level. When force structures rapidly change, concerted efforts to educate leaders and modify these images is needed in order to maintain effective leadership. Study of the development and change of leaders troop image/beliefs are needed to aid in leadership development, training, and education.

TRAINING

1. Development of training programs for culture stress involved in service in multinational forces and triservice operations are needed. Gender differences are important to note in this training.

2. Military professional schools currently emphasize providing diverse representation in all small group assignments. This can result in the lack of a critical mass of women in any group (e.g., more than 1 woman per group). Alternative experiences should be developed in which either panels with multiple representation of women or other larger "small" groups (5 or more women) are also part of training environments. Such provision of minimum core elements provides a different learning experience and decreases the stress on individuals who are assumed to represent a particular viewpoint because of their gender.

3. Mentoring is one of the most important training experiences. Institutional training on ways to facilitate and ensure high quality mentoring should be attended to. Data from the Army Research Institute indicate that, contrary to expectations, females were not at a disadvantage for being mentored. About 85% of female and male officers and senior NCO's indicated they were mentored in the past and about 47% said they were currently being mentored.

4. Instruction at each level of professional military education should include instruction on how to seek and provide peer support, and how to seek and provide mentoring. Instruction in these areas should be directed toward the development of peer and senior mentor relationships to foster career development and maintain psychological well-being in mixed and like-sexed dyads.

5. Women have higher current and lifetime prevalence rates of anxiety and depressive disorders. Training health care providers on the identification of these disorders in primary care settings is needed in order that appropriate treatment can be rendered. Some studies indicate that these disorders may contribute to the development of PTSD following traumatic exposure. Therefore, their appropriate treatment and resolution is particularly important in military populations.

6. Women in the military may be subject to multiple life stressors to which their male counterparts are not subject (independent of those specifically related to service in the military): These gender differences may be the result of:

- a. More stressful work/home conflicts among women.
- b. Value differences, e.g., women tend to place higher value on non-work life than men, while men's identity is more strongly tied to their work.
- c. Lack of "fit" between the woman and a male work environment.
- d. Being devalued and having less support from male colleagues and supervisors.
- e. Women's greater willingness to admit feeling stress and endorse items asking about health and mental health problems.

Inclusion of these issues in training, particularly as they relate to deployment and combat readiness, is needed.

7. Leaders and medical care providers should be educated to identify potential stressors on female troops and male troops. Such stressors will overlap but are not the same.

8. Findings from the Viet Nam era indicate 8.5% of women had Posttraumatic Stress Disorder (PTSD) at the time of the NVVRS Study (1987) which used the best diagnostic methodology available (SCID). Among those exposed to high levels of war zone stress, the prevalence of PTSD was 17.5% versus 2.5% for those with low to moderate exposure. Comparable estimates for Viet Nam era veterans (1.1%) and civilians (0.3%) were made. Nurses were at particular risk. Training of health care providers needs to emphasize identification of individuals at risk (both males and females) for longer term problems, as well as the normalcy of a wide range of reactions to the "abnormal" environments of combat and operations other than war.

9. It is important to remember that findings of analyses from Viet Nam era indicate the single strongest factor to predict PTSD in women was the same as that for men, war zone stressor exposure. Training must incorporate these important findings in plans for early identification and treatment.

10. Studies of military environments, as have been done in the Army, should control for unit assignment in order to further clarify differences which may be seen between males and females. The delineation of these differences can then be incorporated into training.

11. Gender differences in coping strategies should be incorporated into training in order to widen individuals' resources to adapting to a wide variety of stressful environments.

12. Training scenarios should increasingly include opportunities for failure mode analysis. This should increase service members' (males and females) confidence in their ability to react to the unexpected and will provide a learning experience in which the advantages of heterogeneity are demonstrated.

13. Readiness training for medical units should be supported through a reexamination of what the specific goals are for readiness training and how they can best be achieved. Readiness training should include training to manage casualties in CONUS who were rapidly returned and to identify and treat stress casualties in CONUS which result from increased operational tempo.

14. A Joint Military Medical Readiness Center with fellowship opportunities should be established in which medical personnel (male and female) can meet across services and across disciplines to receive readiness training and professional military education periodically during a career. (Similar to Command & General Staff/War College but with shorter course periods, e.g., 1-6 months.) This will increase knowledge of cross service gender differences and decrease gender-related combat differences which may appear in joint operations. An institution such as the Uniformed Services University can well serve this purpose and both maintain lessons learned and incorporate new changes rapidly for the education and training of future medical leaders.

15. Readiness training must attend not only to issues affecting "front line" servicemembers but also the subsequent reverberations through other echelons. Anticipated increased rates of fatigue, somatization and depression in CONUS units supporting frontline operations should be identified and treated.

16. Studies of training indicate that training exercises may increase skills and performance and possibly decrease psychiatric morbidity. In the area of exposure to the grotesque (expected of all combat participants when they are exposed to death and the dead), data suggest that women may be more vulnerable to this stressor. However, this vulnerability may be primarily related to lack of past training, and past exposure to such events which may be appropriately dealt with through targeted training.

17. Applied research is needed to develop innovative educational tools for medical readiness education using technological advances in communication such as the INTERNET and interactive video (e.g. establishment of a home page on the Worldwide Web to provide access to different databases on women's health.)

18. Family violence is not uncommon in military families and in active duty women with civilian husbands in particular. Training for health care workers in identifying victims of family violence is needed.

MEDICAL CARE

1. Medical personnel should be alert to the risk of suicide and/or unintentional injury post-combat exposure. Recent literature supports a potential increased risk of suicide following combat exposure in Viet Nam veterans.

2. The area of substance abuse in women emphasizes the importance of distinguishing the prevalence of a disorder from the significance of the problem. Although the prevalence of substance abuse in women is lower than that of men, it remains a substantial problem because of its rate and the medical and operational cost of the disorder.

- a) The effects of substance abuse (including smoking) on pregnancy is substantial in civilian and military settings. Training of health care providers in this area is important as well as developing baseline data.
- b) Some medical interventions designed for male alcoholics may not be as effective as other strategies in assisting women. These possible differences need to be considered in providing care for substance abuse disorders and prevention.

3. The health care delivery system must be attuned to the treatment of substance abuse in women as well as men.

4. Exposure to sexual assault is a significant risk factor for the development of PTSD, particularly in women. Medical care training and facilities should develop mechanisms to better identify and manage sexual assault victims.

5. Women have higher current and lifetime prevalence rates of anxiety and mood disorders. Inservice training should be provided for outpatient troop clinics and family clinics on the early recognition these disorders so the appropriate treatment can be rendered. Some studies indicate that these disorders may contribute to the development of PTSD following traumatic exposure. Therefore, their appropriate treatment and resolution is particularly important.

6. Physical health problems are associated with the diagnosis of PTSD in women and men. Little is known about these physical health problems, to what extent they are related to injury or somatization. Training to appropriately identify and treat physical health problems reported following traumatic exposure is needed.

7. Medical care providers should be alert to the presentation of somatic symptoms in individuals exposed to traumatic events of wartime and peacetime.

8. Medical care providers should be trained in cultural factors impacting health care delivery. Training should bridge the knowledge and skills gaps experienced in deployments to unfamiliar cultures and resource-poor environments.

9. Often wartime deployment means how to “make do” with fewer resources. Contingency training might include similar settings. For example, it may be helpful to use USPHS hospitals to approximate the challenges faced in working with refugees and other impoverished populations.

10. Medical care providers must be mindful of the various ways in which symptoms manifest themselves in different cultures, genders and organizational contexts. It is also important for health care providers to be trained in understanding the recovery from stress symptoms and how it may vary over time (e.g., differences in intrusion and arousal symptoms), how one might recover from one symptom and not another, and how that might be reflected differently in various sub-populations, including gender differences.